

REMARKS

Applicant respectfully requests reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

Claims 1, 3-7, 11 and 16 are currently being amended.

New claims 17-30 are being added. New claims 17-29 correspond to claims 2-14, respectively, but depend ultimately from independent claim 15. New claim 30 is a method claim corresponding to independent claims 1 and 15.

This amendment adds, changes and/or deletes claims in this application. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier.

After amending the claims as set forth above, claims 1-30 are now pending in this application.

Rejection under 35 U.S.C. § 112, second paragraph

Claims 4-7 and 11 stand rejected under 35 U.S.C. § 112, second paragraph as being indefinite. Claims 4-7 and 11 have been amended to address the issues raised in the Office Action, and applicant submits that the rejection under 35 U.S.C. § 112, second paragraph has been overcome.

Rejections under 35 U.S.C. §§ 102 and 103

Claims 1-4 and 6-16 stand rejected under 35 U.S.C. § 102(b) as being anticipated by EP 0782880 to Noda et al. (hereafter "Noda"). Claims 1-2, 4, 6-7, 11 and 15-16 stand rejected under 35 U.S.C. § 102(b) as being anticipated by EP 0852966 to Ikeda et al. (hereafter "Ikeda"). Claim 5 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Noda in view of U.S. Patent No. 5,164,350 to Abe et al. (hereafter "Abe"). Claims 8-10 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ikeda in view of Noda. Applicant respectfully traverses these rejections for at least the following reasons.

Independent claim 1 is directed to an exhaust gas purifying catalyst. The exhaust gas purifying catalyst includes a catalytic layer for producing hydrogen (H₂) and reducing NOx.

Independent claim 1 has also been amended to clarify that the exhaust gas to be brought into contact with the catalytic layer has a composition meeting a relation [(a concentration of hydrogen / a concentration of total reducing components) ≥ 0.3]. Support for this amendment can be found at least in original claim 15.

Providing (as recited in claim 1) that the exhaust gas to be brought into contact with said catalytic layer has a composition meeting a relation [(a concentration of hydrogen / a concentration of total reducing components) ≥ 0.3] provides advantages. As disclosed in the specification, when the exhaust gas composition meets the relation as recited in claim 1, the concentration of H₂ in the exhaust gas rises thereby providing even further NO_x reducing performance (see the present specification, page 11, lines 12-15). By contrast, in conventional techniques, exhaust gas from automotive engines or from exhaust systems including exhaust gas purifying catalysts has a relation [(a concentration of hydrogen / a concentration of total reducing components) < 0.3]. Consequently, the rate or concentration of H₂ in the exhaust gas is considerably smaller in the conventional techniques so that it is impossible to effectively use H₂ as reducing component or agent (see the present specification, page 11, lines 15-21).

Neither Noda nor Ikeda disclose or suggest the relation of the exhaust gas as recited in claim 1, nor the resulting significant advantages in further NO_x reducing performance. With respect to Noda, the Office Action states at page 4 that “With regards to claim 16, Table 2 (page 10) details an engine which generates an exhaust gas which meets the claimed hydrogen/reducing components ratio.” Applicant notes that original claim 16 did not recite a hydrogen/reducing components ratio. In any event, Table 2 of Noda does not disclose the relation of the exhaust gas as recited in claim 1. In Table 2, Noda discloses a composition of synthetic exhaust gas which is used in an experiment. Accordingly, the composition of the synthetic exhaust gas is not one regulated to be supplied to a catalyst in its regular use, and in this sense Noda does not disclose the invention as recited in claim 1.

Moreover, even if the composition of the synthetic exhaust gas of Noda were to be the composition of exhaust gas to be supplied to the catalyst in regular operation, the composition of exhaust gas as disclosed in Noda does not meet the relation recited in claim 1, where exhaust for the exhaust gas purifying catalyst has a relation [(a concentration of hydrogen / a concentration of total reducing components) ≥ 0.3], as explained below.

As a result of applicant's calculation, the (concentration of hydrogen) / (a concentration of total reducing components) becomes (where the total reducing components are CO, H₂ and HC) for Noda:

$$2 / (0.7 + 0.2 + 0.28) = 0.2 / 1.18 = 0.17 \text{ when } \lambda = 1.0$$

$$2 / (0.5 + 0.2 + 0.22) = 0.2 / 0.92 = 0.22 \text{ when } \lambda = 1.3$$

$$2 / (2.0 + 0.33 + 0.45) = 0.33 / 2.78 = 0.12 \text{ when } \lambda = 0.96.$$

Thus, Noda discloses (a concentration of hydrogen / a concentration of total reducing components) < 0.3 in all cases.

The remaining reference of Abe also fails to suggest the relation of the exhaust gas to be brought into contact with the catalytic layer as recited in claim 1, and thus fails to cure the deficiencies of Noda or Ikeda.

Independent claim 15 is directed to an exhaust gas purifying system and includes "a device for controlling combustion in the engine to produce exhaust gas, to be brought into contact with said catalytic layer, having a composition meeting a relation [(a concentration of hydrogen / a concentration of total reducing components) \geq 0.3]." Thus, claim 15 is patentable over Noda, Ikeda and Abe for at least the same reasons as claim 1, discussed above.

Independent claim 16 is directed to a method of producing an exhaust gas purifying catalyst. Claim 16 has been amended in a corresponding fashion to claim 1. Thus, claim 16 is also patentable over Noda, Ikeda and Abe for at least the same reasons as claim 1, discussed above.

The dependent claims depend from either claim 1 or claim 15, and thus are patentable over Noda, Ikeda and Abe for at least the same reasons, as well as for further patentable features recited therein.

For at least the reasons provided above, applicant respectfully requests that the rejection of claims 1-16 under 35 U.S.C. 102 or 103 be withdrawn.

Independent claim 30 is directed to a method corresponding to claim 1, and includes "supplying exhaust gas to contact said catalytic layer, the exhaust gas having a composition meeting a relation [(a concentration of hydrogen / a concentration of total reducing components) \geq 0.3]." Thus, claim 30 is likewise patentable over Noda, Ikeda and Abe. Claim 30 is commensurate in scope with claims 1 and 15 and should be allowed upon the allowance of either of those claims.

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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